Econ 311: Behavioral and Experimental Economics

Prof. Jeffrey Naecker

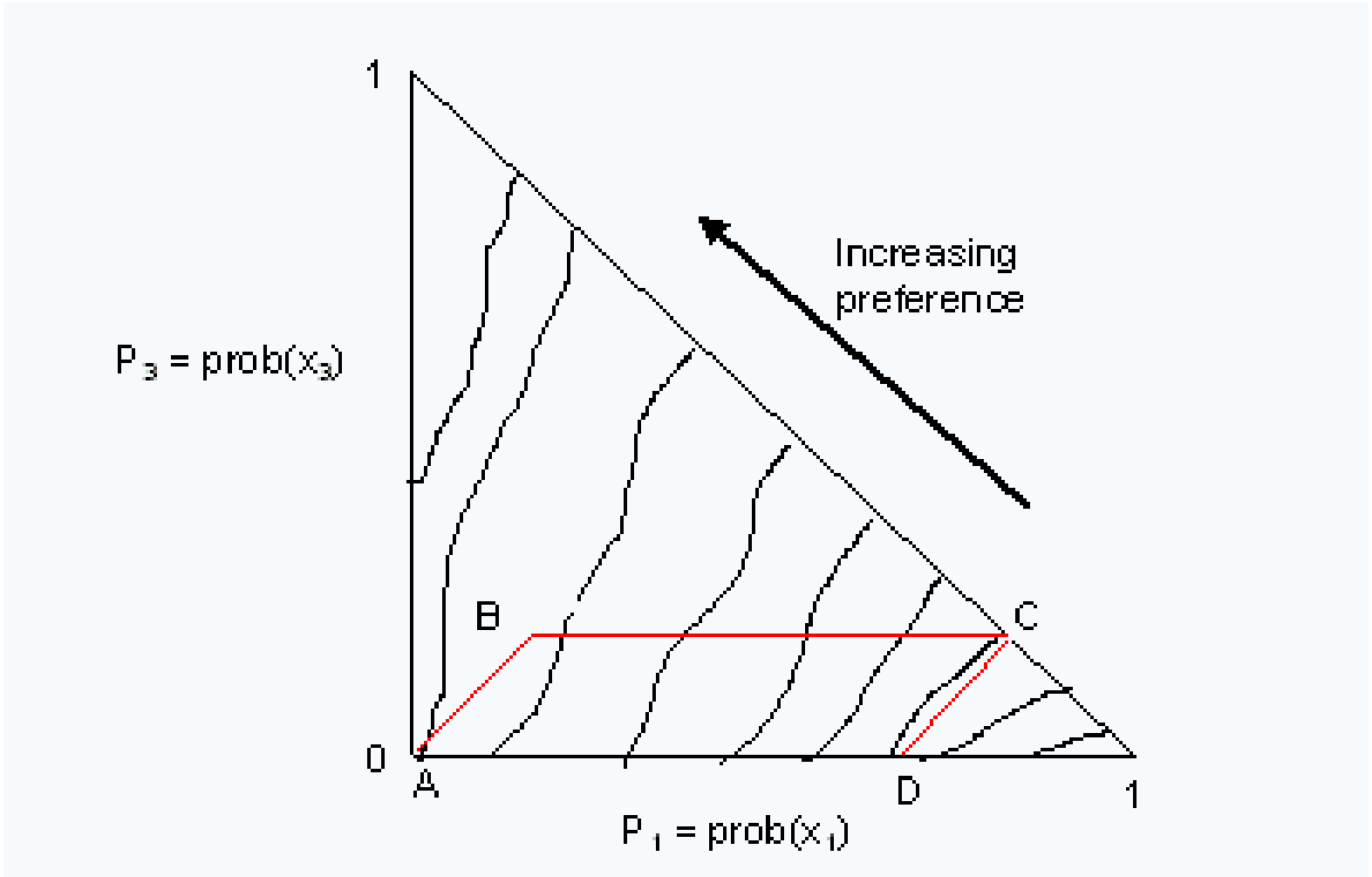
Wesleyan University

Evidence for Prospect Theory

Prospect Theory in the Machina Triangle

- What do indifference curves for prospect theory look like in Machina triangle?
- Put Allais Paradox choices from earlier on the triangle:
  A: Receive \$100 million for certain
  B: 10% chance of \$500 million, 89% chance of \$100 million, 1% chance of no money
  A': 11% chance of \$100 million, 89% chance of no money
  B': 10% chance of \$500 million, 90% chance of no money
- Lines connecting A to B and A' to B' are parallel by construction
- Yet many people choose A over B but B' over A'
- Indifference curves must be *fanning out*

Machina Triangle: Fanning Out Indifference Curves



Evidence for Reference-Dependence and Loss Aversion

- We have already seen two key pieces of evidence for the reference dependence/loss aversion part of prospect theory
  - Lab evidence: Kahneman, Knetch, and Thaler (1990) mug experiment
    - We did this with notebooks
    - Prospect theory can explain behavior known as *endowment effect*
  - Field evidence: Camerer et al (1997) taxi cabs
    - Shows that behavioral effects have large impact on real labor supply decisions
- What about evidence for probability weighting?

Evidence for Probability Weighting

- Tversky and Kahneman (1992) recuited 25 graduation students
- Paid fixed amount for participation (unincentivized choices)
- Decision problem
  - Shown a two-state gamble of the form $(p, x : 1 - p, 0)$ for various x and p
  - Asked to state dollar amount c that would make them indifferent between c for sure and gamble, ie the certainty equivalent
- What do we expect to find?
  - Utility of gamble is $\pi(p)u(x)$
  - By design of the experiment, $u(c(p)) = \pi(p)u(x)$
  - If we assume value function is linear:

$$\pi(p) = \frac{c(p)}{x}$$

  - So plotting reported values of $\frac{c}{x}$ vs changing levels of p should return $\pi(p)$

Tversky and Kahneman (1992) Results

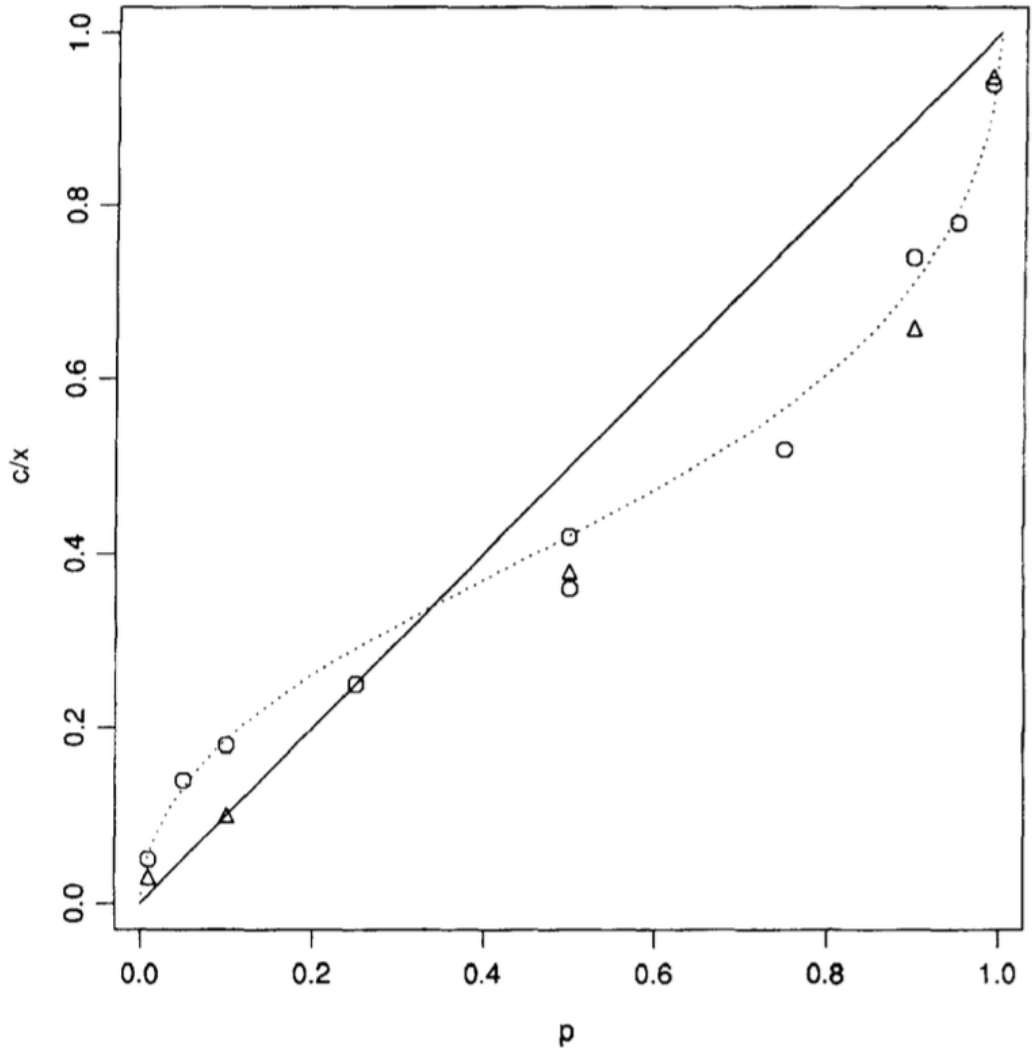


Figure 1. Median c/x for all positive prospects of the form $(x, p; 0, 1 - p)$. Triangles and circles, respectively, correspond to values of x that lie above or below 200.

Other Non-Expected Utility Theories

Expectations-Based Reference Dependence

- Recall our discussion of possible sources of reference point
  - Status quo wealth
  - Aspirational wealth level
  - Relation to others
  - Expectations about future uncertain outcome
- Expectations offer a possible way to "close" the model
- Leads to another reference-dependent model (different from prospect theory): disappointment aversion

Disappointment Aversion

- Idea: reference level of utility is utility of expected value
- Gamble $(p, X; 1-p, Y)$ for $Y < X$
- Define certainty equivalent C_p by

$$u(C_p) = pu(X) + (1-p)u(Y)$$

  - Note this is defined in terms of the standard theory
- Then value function is consumption utility plus a disappointment term:

$$\tilde{u}(C|C_p) = u(C) + \mu\left[u(C) - u(C_p)\right]$$

- Finally, expected utility of whole gamble:

$$U = p\tilde{u}(C|C_p) + (1-p)\tilde{u}(Y|C_p)$$